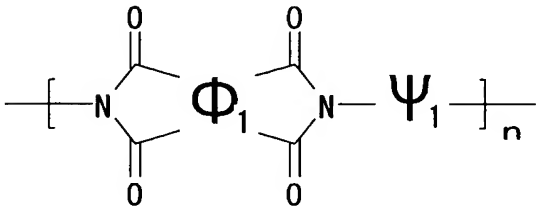
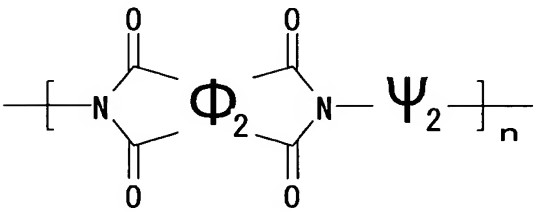
WHAT IS CLAIMED IS:

1. A polyimide optical material, comprising heterocyclic polyimide having an unit represented by the following general formula (1), (2) or (3):



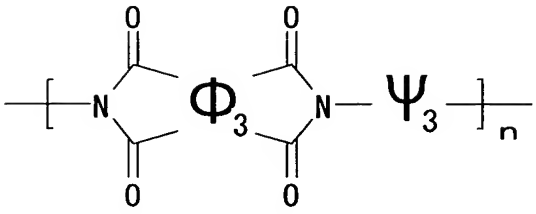
· · · (1)

(wherein Φ_1s are the same or different and are individually a quadrivalent organic group, the Φ_1s including at least 0.2 molar equivalent of a quadrivalent hetrocyclic group selected from the following Group (a); Ψ_1s may be the same or different and are individually a bivalent organic group; and n is a positive integer),



· · · (2)

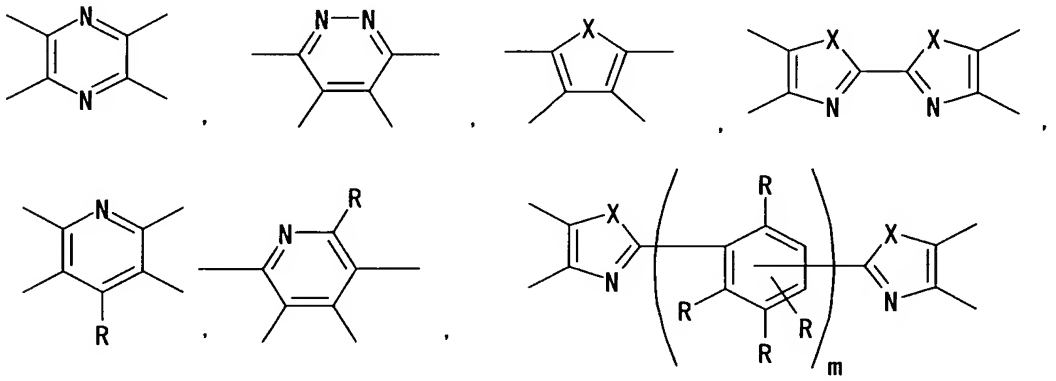
(wherein Φ_2s are the same or different and are individually a quadrivalent organic group; Ψ_2s may be the same or different and are individually a bivalent organic group, the Ψ_2s including at least 0.2 molar equivalent of a bivalent hetrocyclic group selected from the following Group (b); and n is a positive integer),



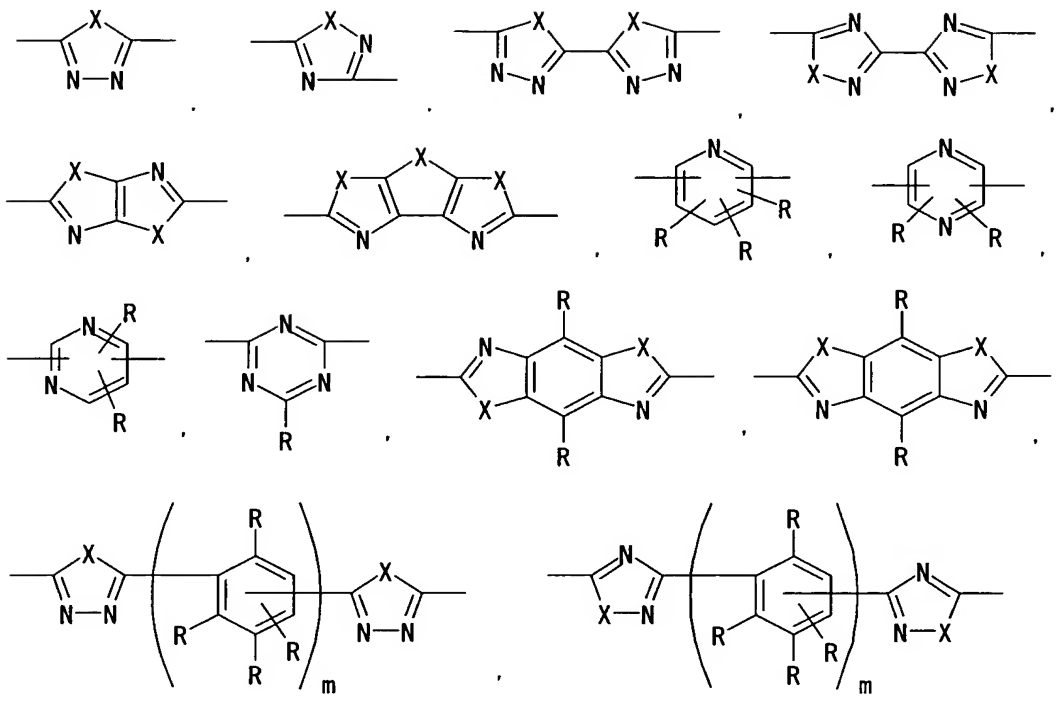
... (3)

(wherein Φ_3s are the same or different and are individually a quadrivalent organic group, the Φ_3s including at least 0.1 molar equivalent of a quadrivalent hetrocyclic group selected from the following Group (a); Ψ_3s may be the same or different and are individually a bivalent organic group, the Ψ_3s including at least 0.1 molar equivalent of a bivalent hetrocyclic group selected from the following Group (b); and n is a positive integer):

Group (a):



Group (b):



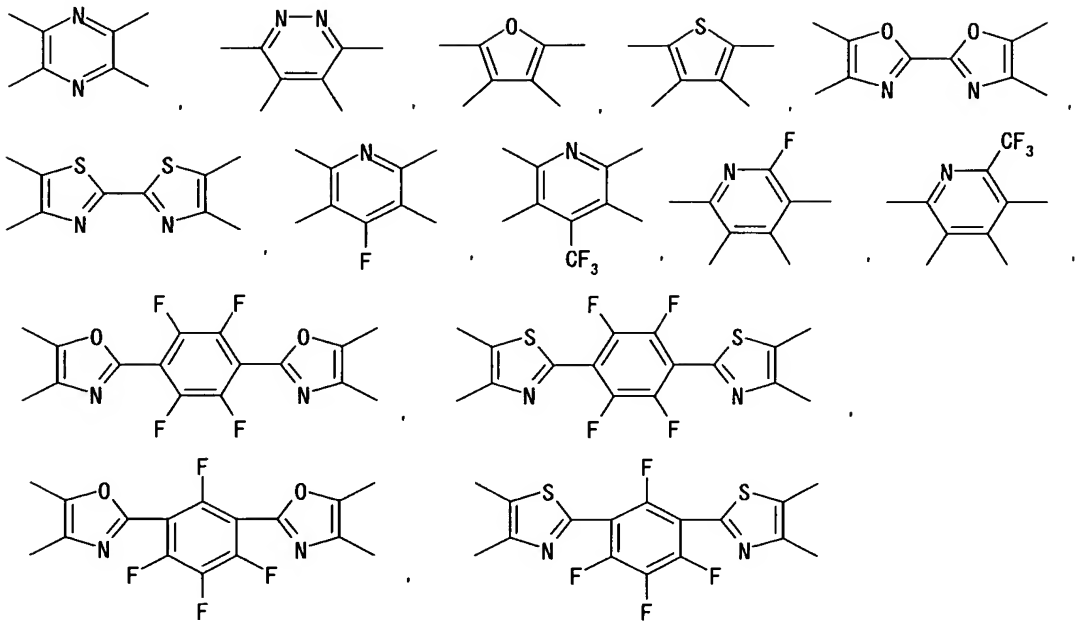
(In the above formulas, Xs are the same or different and are individually >O group, >S group or >N-R^f group (R^f group is perfluoroalkyl group); R are the same or different and are individually fluoro group, chloro group, bromo group, iodo group, perfluoroalkyl group, perfluoroalkoxy group, perfluoroalkylthio group, nitro group or cyano group; m is an integer of 1 to 4).

2. The polyimide optical material according to claim 1, wherein the polyimide optical material is formed of a compound represented by the general formula (1).

3. The polyimide optical material according to claim 2, wherein the quadrivalent hetrocyclic group

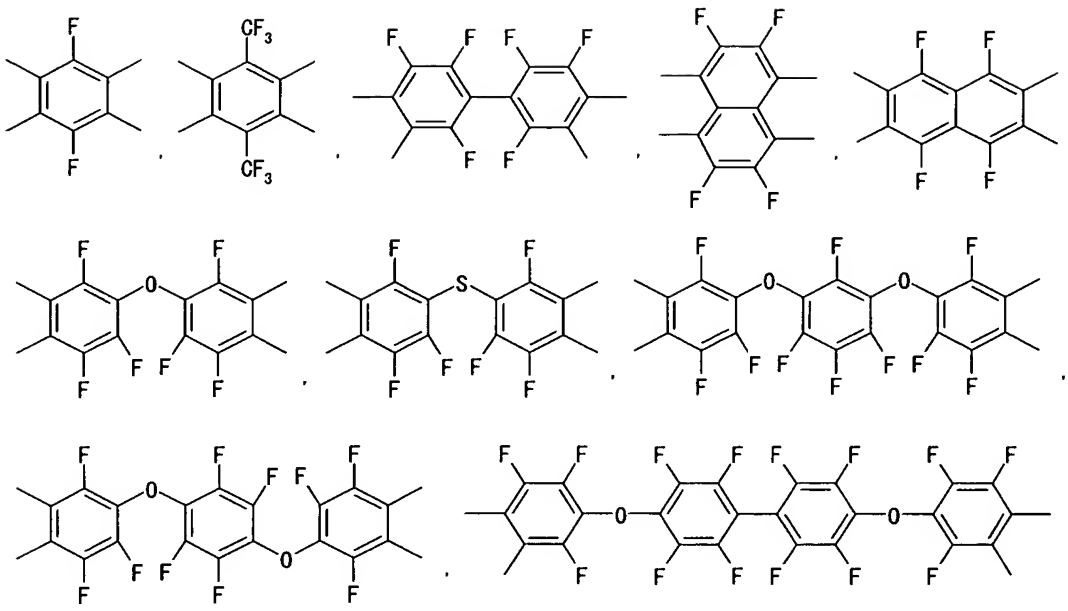
selected from the Group (a) are the groups shown in the following Group (c):

Group (c):



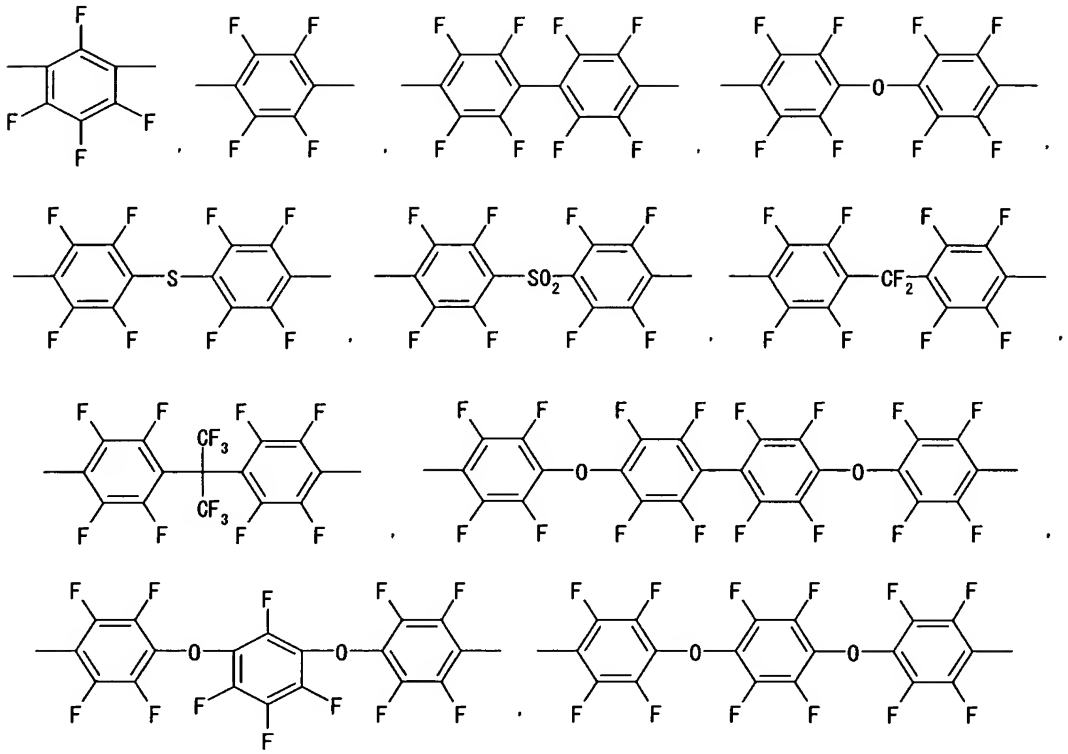
4. The polyimide optical material according to claim 2, wherein the balance of the Φ_1s is selected from the quadrivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (e):

Group (e):



5. The polyimide optical material according to claim 2, wherein the bivalent organic groups Ψ_1s are selected from the bivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (f):

Group (f):

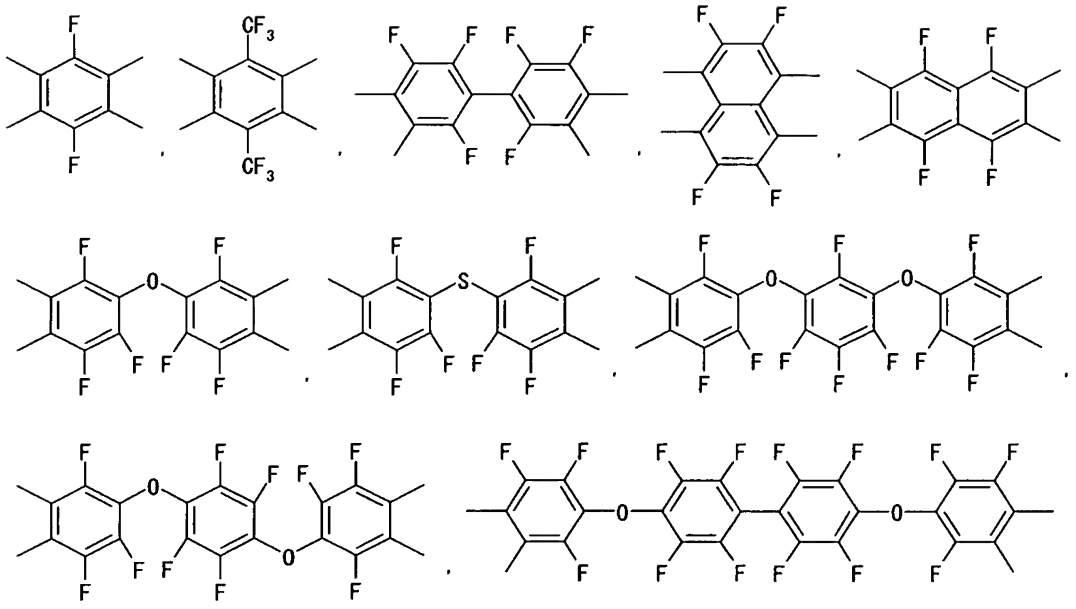


6. The polyimide optical material according to claim 2, wherein the content of fluorine atoms in the unit represented by the general formula (1) is confined within the range of 5 to 40% by weight.

7. The polyimide optical material according to claim 1, wherein the polyimide optical material is formed of a compound represented by the general formula (2).

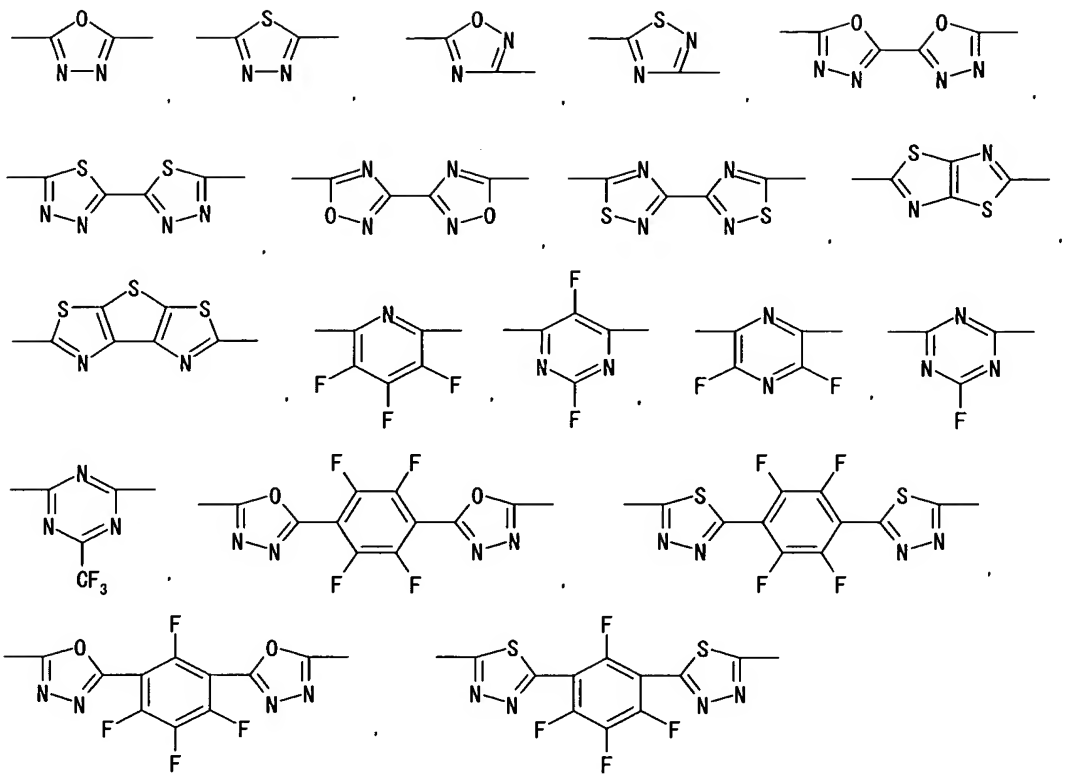
8. The polyimide optical material according to claim 7, wherein the bivalent hetrocyclic group of the Group (b) are the quadrivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (e):

Group (e):



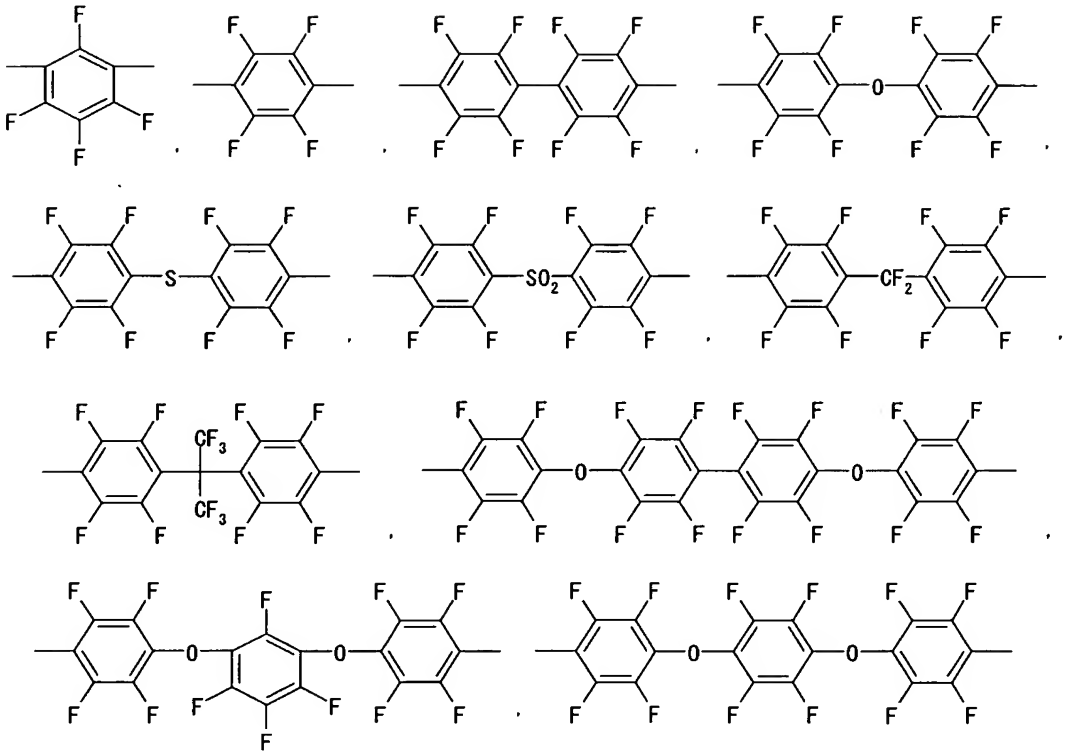
9. The polyimide optical material according to claim 7, wherein the bivalent hetrocyclic group of the Group (b) are the bivalent aromatic heterocyclic groups shown in the following Group (d):

Group (d):



10. The polyimide optical material according to claim 7, wherein the balance of the Ψ_2s is selected from the bivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (f):

Group (f):

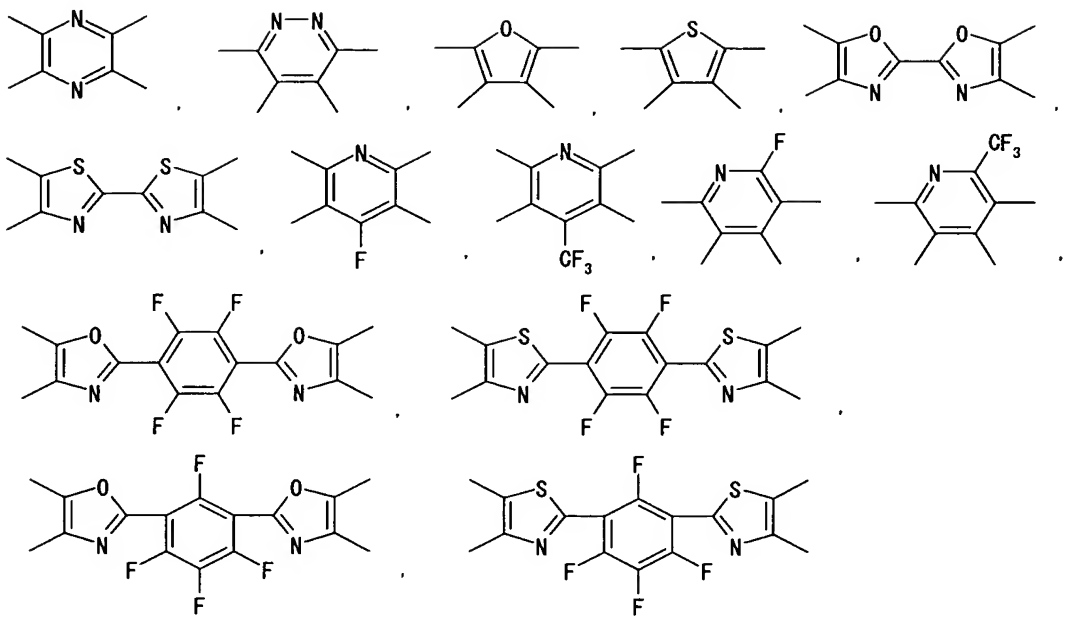


11. The polyimide optical material according to claim 7, wherein the content of fluorine atoms in the unit represented by the general formula (2) is confined within the range of 5 to 40% by weight.

12. The polyimide optical material according to claim 1, wherein the polyimide optical material is formed of a compound represented by the general formula (3).

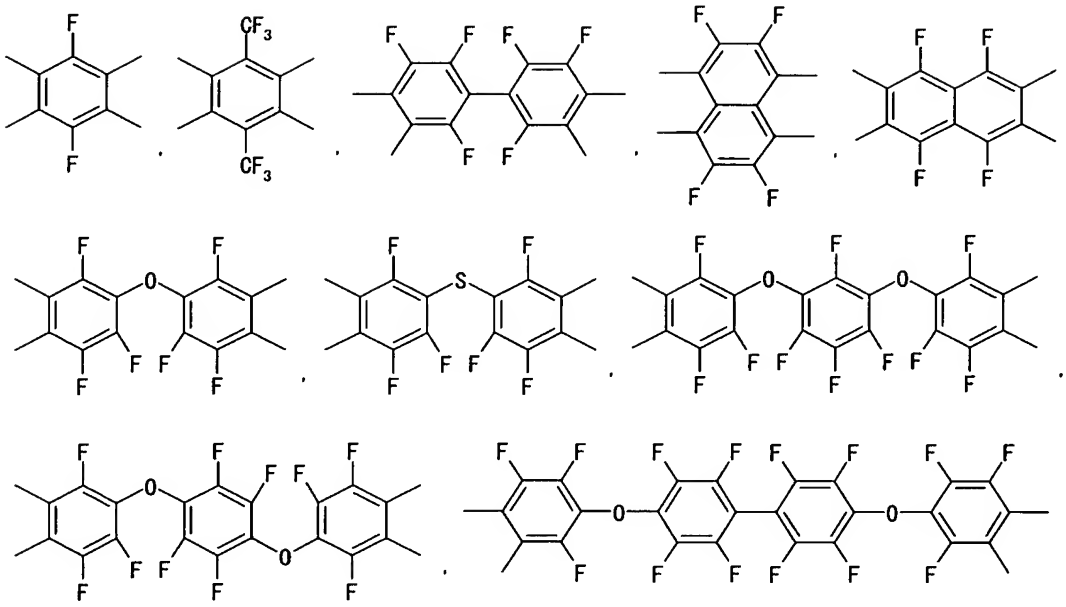
13. The polyimide optical material according to claim 12, wherein the quadrivalent hetrocyclic groups of the Group (a) are the quadrivalent aromatic hetrocyclic groups shown in the following Group (c):

Group (c):



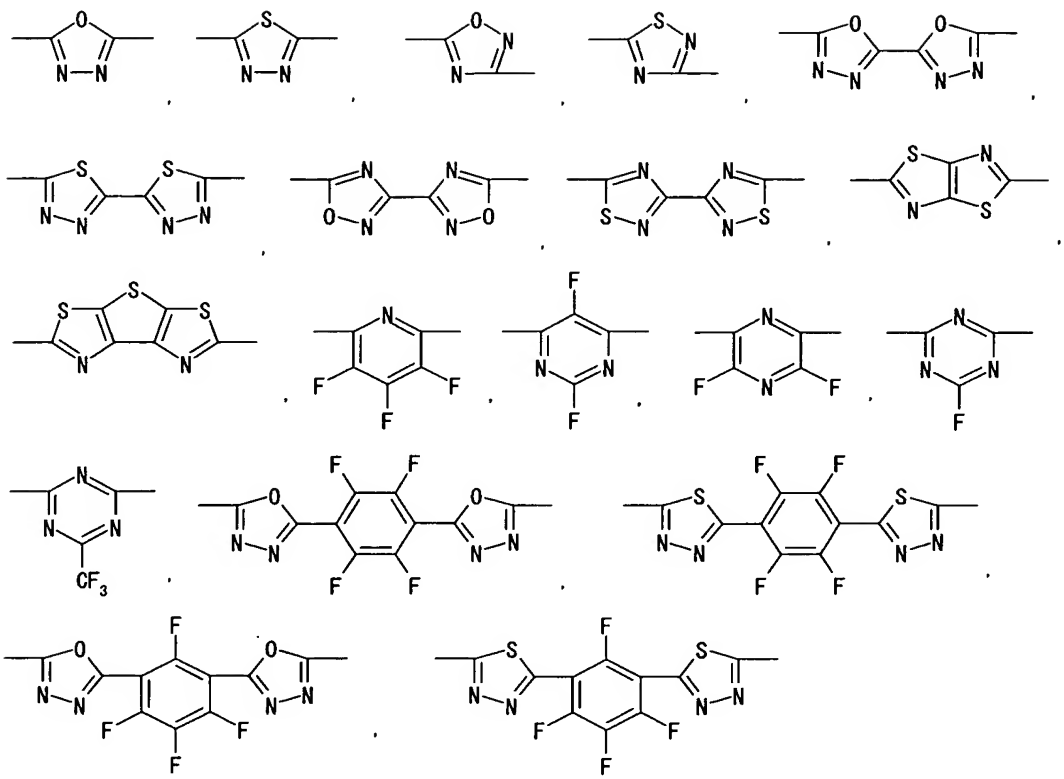
14. The polyimide optical material according to claim 12, wherein the balance of the Φ_3s is selected from quadrivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (e):

Group (e):



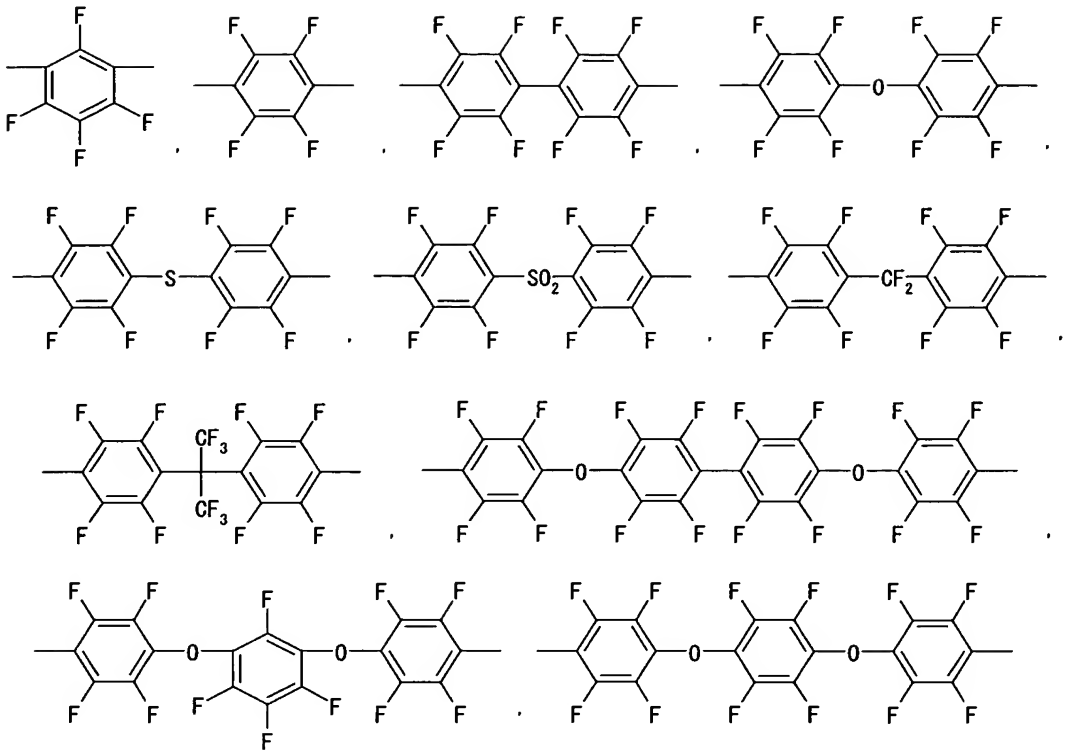
15. The polyimide optical material according to claim 12, wherein the bivalent hetrocyclic group of the Group (b) are the bivalent aromatic heterocyclic groups shown in the following Group (d):

Group (d):



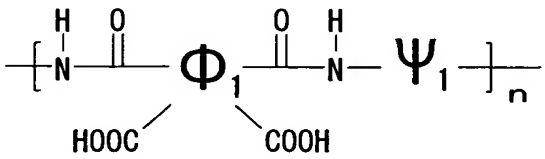
16. The polyimide optical material according to claim 12, wherein the balance of the Ψ_3s is selected from the bivalent fluorine-substituted aromatic hydrocarbon groups shown in the following Group (f):

Group (f):



17. The polyimide optical material according to claim 12, wherein the content of fluorine atoms in the unit represented by the general formula (3) is confined within the range of 5 to 40% by weight.

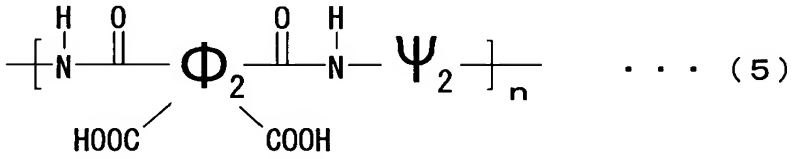
18. A polyimide precursor solution comprising a heterocyclic polyamic acid having an unit represented by the following general formula (4), (5) or (6):



(4)

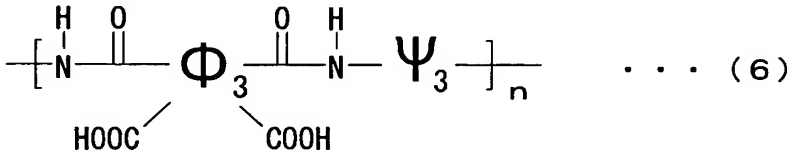
(wherein Φ_1s may be the same or different and are individually a quadrivalent organic group, the Φ_1s

including at least 0.2 molar equivalent of a quadrivalent hetrocyclic group selected from the following Group (a); Ψ_1s may be the same or different and are individually a bivalent organic group; and n is a positive integer).



(5)

(wherein Φ_2s may be the same or different and are individually a quadrivalent organic group; Ψ_2s may be the same or different and are individually a bivalent organic group, the Ψ_2s including at least 0.2 molar equivalent of a bivalent hetrocyclic group selected from the following Group (b); and n is a positive integer).

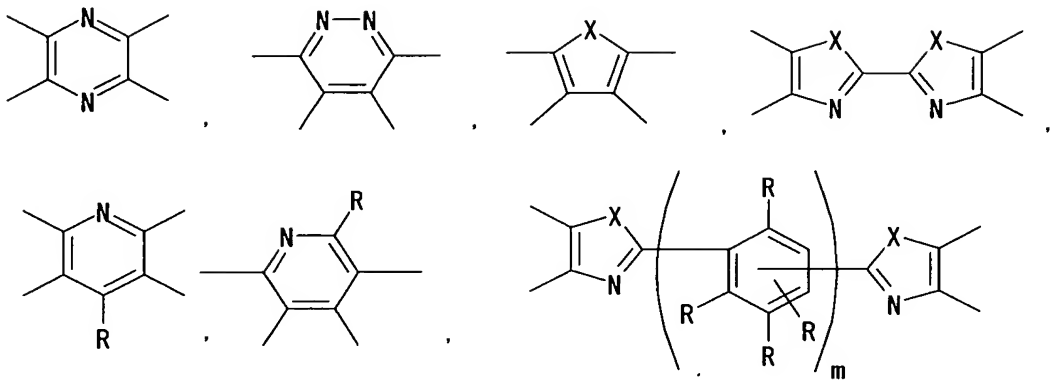


(6)

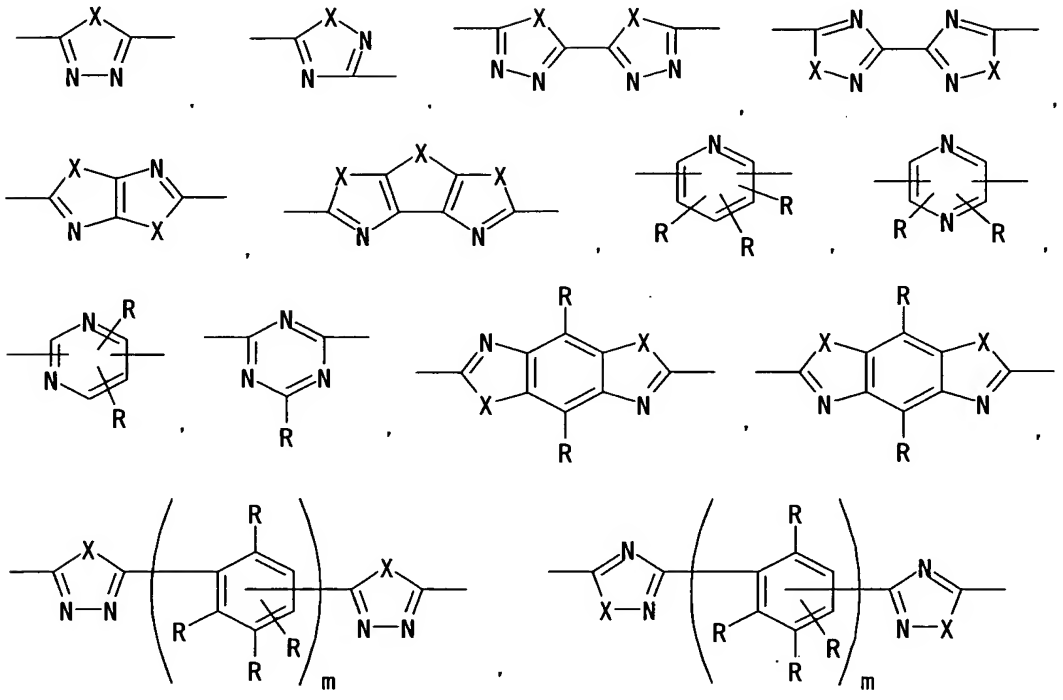
(wherein Φ_3s may be the same or different and are individually a quadrivalent organic group, the Φ_3s including at least 0.1 molar equivalent of a quadrivalent hetrocyclic group selected from the following Group (a); Ψ_3s may be the same or different and are individually a bivalent organic group, the Ψ_3s including at least 0.1 molar equivalent of a bivalent hetrocyclic group selected from the following

Group (b); and n is a positive integer).

Group (a):



Group (b):



(In the above formulas, X may be the same or different and are individually >O group, >S group or >N-R^f group (R^f group is perfluoroalkyl group); R may be the same or different and are individually fluoro

group, chloro group, bromo group, iodo group, perfluoroalkyl group, perfluoroalkoxy group, perfluoroalkylthio group, nitro group or cyano group; m is an integer of 1 to 4).

19. An optical waveguide element comprising a core layer and a clad layer, wherein the core layer and/or the clad layer contain the polyimide optical material claimed in claim 1.